SECTION 07905 - JOINT SEALERS

City of San Diego, CWP Guidelines

PART 1 -- GENERAL

1.1 WORK OF THIS SECTION

A. The WORK of this Section includes providing joint sealers and appurtenant WORK, complete.

1.2 RELATED SECTIONS

A. The WORK of the following Sections applies to the WORK of this Section. Other Sections of the Specifications, not referenced below, shall also apply to the extent required for proper performance of this WORK.

1. Section 07920 Sealants and Caulking
2. Section 08800 Glazing

1.3 CODES

A. The WORK of this Section shall comply with the current editions of the following codes as adopted by the City of San Diego Municipal Code:

1. Uniform Building Code

1.4 SPECIFICATIONS AND STANDARDS

1. Except as otherwise indicated, the current editions of the following apply to the WORK of this Section:

2.	ASTM C 719	Test Method for Adhesion and Cohesion of Elastomeric Joint Sealants Under Cyclic Movement
3.	ASTM C 790	Recommended Practices for Use of Latex Sealing Compounds
4.	ASTM C 804	Recommended Practices for Use of Solvent-Release Type Sealants
5.	ASTM C 834	Specification for Latex Sealant Compounds
6.	ASTM C 919	Practice for Use of Sealants in Acoustical Applications
7.	ASTM C 920	Specification for Elastomeric Joint Sealants
8.	ASTM C 962	Guide for Use of Elastomeric Joint Sealants

9.	ASTM D 412	Test Methods for Rubber Properties in Tension
10.	ASTM D 1056	Specification for Flexible Cellular Materials - Sponge or Expanded Rubber
11.	ASTM D 2628	Specification for Preformed Polychloroprene Elastomeric Joint Seals for Concrete
12.	ASTM D 3405	Specification for Joint Sealants, Hot-Poured, for Concrete and Asphalt Pavements
13.	ASTM D 3406	Specification for Joint Sealant, Hot-Poured, Elastomeric-Type, for Portland Cement Concrete Pavement

1.5 SHOP DRAWINGS AND SAMPLES

A. The following shall be submitted in compliance with Section 01300:

1. Product Data: Manufacturer's recommended applications and technical data for each joint sealer product required, including instructions for joint preparation and joint sealer application.

2. Samples for Initial Selection Purposes: Submit manufacturer's standard bead samples consisting of strips of actual products showing the full range of colors available, for each product exposed to view.

1.6 PRODUCT DELIVERY, STORAGE AND HANDLING

A. **Delivery of Materials**: Manufactured materials shall be delivered in original, unbroken packages or containers bearing the manufacturer's label. Packages or containers shall be delivered to the site with seals unbroken.

B. Manufacturer's labels shall bear name of manufacturer, product name and designation, color, expiration period for use, pot life, curing time and mixing instructions for multi-component materials.

1. **Storage**: All materials shall be carefully stored in an area that is protected from deleterious elements and in a manner recommended by the product manufacturer. Storage and handling of materials shall be in such a manner as to prevent deterioration or damage due to moisture, temperature changes, contaminants or other causes.

PART 2 -- PRODUCTS

2.1 GENERAL

A. **Manufacturer's Recommendations**: Only products recommended for the specific application indicated shall be used.

B. **Single Source Responsibility**: All joint sealer materials for a specific application shall be obtained from a single manufacturer.

C. **Compatibility**: Joint sealers, joint fillers, and other related materials shall be provided which are compatible with one another and with joint substrates under the indicated conditions of service and application, as demonstrated by manufacturer's testing and field experience.

D. **Colors**: Colors of exposed joint sealers shall be provided as indicated or, if not otherwise indicated, as selected by the CONSTRUCTION MANAGER from manufacturer's standard colors.

2.2 ELASTOMERIC JOINT SEALANTS

A. **Elastomeric Sealant Standards**: Manufacturer's standard chemically curing elastomeric sealant shall be of base polymer indicated which complies with ASTM C 920 requirements, including those for Type, Grade, Class and Uses.

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NTS: Select from the following joint sealants, as appropriate to the requirements of the project.

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1. Two-Part Nonsag Polysulfide Sealant: Type M; Grade NS; Class 12 1/2; Uses NT, M, G, A, and as applicable to the joint substrate indicated, Use O.

2. Two-Part Pourable Polysulfide Sealant: Type M; Grade P; Class 12 1/2; Uses T, M, G, A, and, as applicable to the joint substrates indicated, Use O.

3. Two-Part Water Immersion Polysulfide Sealant: Type M; Grade NS; Class 12 1/2; Uses T, M. G, A, and, as applicable to the joint substrates indicated, Use O; with a history of successful field experience in sealing joints immersed intermittently or continuously in water.

4. One-Part Polysulfide Sealant: Type S; Grade NS; Class 12 1/2; Uses T, M, G, A, and, as applicable to joint substrates indicated, Use O.

5. One-Part Non-Acid-Curing Silicone Sealant: Type S; Grade NS; Class 25; and complying with the following requirements for Uses NT, M, G, A, and, as applicable to joint substrates indicated, Use O. Modulus and additional joint movement capabilities as follows:

   a. Low Modulus: Tensile strength of 45 psi or less at 100 percent elongation when tested after 14 days at 77 degrees F and 50 percent relative humidity per ASTM D 412.

b. Medium Modulus: Tensile strength of not less than 45 nor more than 75 psi or less at 100 percent elongation when tested after 14 days at 77 degrees F and 50 percent relative humidity per ASTM D 412.

c. Additional capability, when tested for adhesion and cohesion under maximum cyclic movement per ASTM C 719, withstand 50 percent increase and decrease of joint width as measured at time of application and remain in compliance with other requirements of ASTM C 920.

6. One-Part Acid-Curing Silicone Sealant: Type S; Grade NS; Class 25; Uses NT, G, A, and, as applicable to joint substrates indicated, Use O.

7. One-Part Mildew-Resistant Silicone Sealant: Type S; Grade NS; Class 25; Uses NT, G, A, and, as applicable to nonporous joint substrates indicated, Use O; formulated with fungicide for sealing interior joints with nonporous substrates around ceramic tile, showers, sinks and plumbing fixtures.

8. Two-Part Non-Acid Curing Silicone Sealant for Use T: Type M; Grade NS; Class 25; Uses T, M, and, as applicable to joint substrates indicated, Use O; and complying with the following requirement for additional joint movement capability:

a. Additional capability, when tested for adhesion and cohesion under maximum cyclic movement per ASTM C 719, to withstand an increase and decrease of 50 percent of joint width as measured at time of application and remain in compliance with other requirements of ASTM C 920.

9. Multi-Part Nonsag Urethane Sealant: Type M; Grade NS; Class 25; Uses NT, M, G, A, and, as applicable to joint substrates indicated, Use O.

10. Two-Part Nonsag Low-Modulus Urethane Sealant: Type M; Grade NS; Class 25; Uses NT, M, A, and as applicable to joint substrates indicated, Use O; with additional capability to withstand an increase and decrease of 50 percent of joint width as measured at time of application and remain in compliance with other requirements of ASTM C 920, based on manufacturer's recommendations and testing.

11. Two-Part Pourable Urethane Sealant: Type M; Grade NS; Class 25; Uses T, M, A, and, as applicable to joint substrates indicated, Use O.

12. Two-Part Nonsag Urethane Sealant for Use T: Type M, Grade NS: Class 25; Uses T, M, A, and, as applicable to joint substrates indicated, Use O.

13. One-Part Nonsag Urethane Sealant: Type S; Grade NS; Class 25; Uses NT, M, A, and, as applicable to joint substrates indicated, Use O.

14. One-Part Nonsag Low-Modulus Urethane Sealant: Type S; Grade NS; Class 25; Uses NT, M, A, and, as applicable to joint substrates indicated, Use ; with additional capability to withstand an increase and decrease of 50 percent of joint width as

measured at time of application and remain in compliance with other requirements of ASTM C 920, based on manufacturer's recommendations and testing.

15. One-Part Pourable Urethane Sealant: Type S; Grade P; Class 25; Uses T, M,. and, as applicable to joint substrates indicated, Use O.

2.3 SOLVENT RELEASE CURING JOINT SEALANTS

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NTS: Select from the following generic descriptions of joint sealants, as appropriate to the requirements of the projects.

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A. **Acrylic Sealant**: Manufacturer's standard one-part, nonsag, solvent release curing, acrylic terpolymer sealant complying with ASTM C 920 for Type S; Grade NS: Uses NT, M, G, A, and, as applicable to joint substrates indicated, Use O; except for selected test properties which are revised as follows:

1.	Heat aged hardness	-	40 to 50
2.	Weight loss	-	15 percent
3.	Maximum cyclic movement capability (Class)	-	plus or minus 7-1/2 percent

B. **Butyl Sealant**: Manufacturer's standard one-part, nonsag, solvent release curing, polymerized butyl sealant complying with FS TT-S-001657 for Type I and formulated with minimum of 75 percent solids to be nonstaining, paintable, and have a tack-free time of 24 hours or less.

C. **Pigmented Small Joints Sealant**: Manufacturer's standard, solvent release curing, pigmented, synthetic rubber sealant formulated for sealing joints 3/16-inch or smaller in width.

2.4 LATEX JOINT SEALANTS

A. **Acrylic-Emulsion Sealant**: Manufacturer's standard, one- part, nonsag, acrylic, mildew resistant, acrylic-emulsion sealant complying with ASTM C 834, formulated to be paintable and recommended for exposed applications on interior and on protected exterior exposures involving joint movement of not more than plus or minus 7.5 percent.

2.5 MISCELLANEOUS JOINT SEALANTS

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NTS: Select from the following generic descriptions of joint sealants, as appropriate to the requirements of the project.

A. **Acoustical Sealant for Concealed Joints**: Manufacturer's standard, nondrying, nonhardening, nonskinning, nonstaining, gunnable, synthetic rubber sealant recommended for sealing interior concealed joints to reduce transmissions of airborne sound.

B. **Butyl-Polyisobutylene Sealant**: Manufacturer's standard solvent release curing, butyl-polyisobutylene sealant recommended for concealed joints.

C. **Butyl-Polyisobutylene Tape Sealant**: Manufacturer's standard, solvent-free, butyl-polyisobutylene tape sealants with a solids content of 100 percent; formulated to be nonstaining, paintable, and non-migrating in contact with nonporous surfaces; packaged on rolls with release paper on one side; with or without reinforcement thread to prevent stretching.

2.6 COMPRESSION SEALS

A. **Preformed Foam Sealant**: Manufacturer's standard preformed, precompressed, impregnated open-cell foam sealant manufactured from high-density urethane foam impregnated with a nondrying, water repellant agent; factory-produced in precompressed sizes and in roll or stick form to fit joint widths indicated and to develop a watertight and airtight seal when compressed to the degree specified by the manufacturer. Provide products which are permanently elastic, mildew-resistant, non-migratory, nonstaining, compatible with joint substrates and other joint sealers, and comply with the following requirements:

1. Impregnating agent: Manufacturer's standard
2. Density: Manufacturer's standard
3. Backing: Pressure sensitive adhesive, factory applied to one side, with protective wrapping or coated on one face with release agent serving as bond breaker for primary joint sealant.

B. **Preformed Hollow Neoprene Gasket**: Manufacturer's standard preformed polychloroprene elastomeric joint seal of the open-cell compression type complying with ASTM D 2628 and with requirements indicated for size, profile and cross-section design.

2.7 JOINT SEALANT BACKING

A. **General**: Provide sealant backings of material and type which are non-staining; are compatible with joint substrates, sealants, primers and other joint fillers.

B. **Plastic Foam Joint-Fillers**: Preformed, compressible, resilient, non-waxing, non-extruding strips of plastic foam of either flexible, open cell polyurethane foam or non-gassing, closed-cell polyethylene foam, subject to sealant manufacturer's approval; and of size, shape and density to control sealant depth and otherwise contribute to producing optimum sealant performance.

C. **Bond-Breaker Tape**: Polyethylene tape or other plastic tape as recommended by the sealant manufacturer for preventing bond between sealant and joint filler or other materials at the back or third surface of the joint. Provide self-adhesive tape where applicable.

D. **Elastomeric Tubing Joint Fillers**: Neoprene, butyl or EPDM tubing complying with ASTM D 1056, non-absorbent to water and gas, capable of remaining resilient at temperatures down to minus 26 degrees F. Provide products with low compression set and of size and shape to provide a secondary seal, to control sealant depth and otherwise contribute to optimum sealant performance.

2.8 MISCELLANEOUS MATERIALS

A. **Primer**: Provide type recommended by joint sealer manufacturer where required for adhesion of sealant to joint substrates indicated.

B. **Cleaners for Nonporous Surfaces**: Provide non-staining, chemical cleaner of type acceptable to manufacturer of sealant and sealant backing materials which are not harmful to substrates and adjacent nonporous materials.

C. **Masking Tape**: Provide non-staining, non-absorbent type compatible with joint sealants and with surfaces adjacent to joints.

2.9 MANUFACTURERS

A. Products of the type indicated shall be manufactured by one of the following (or equal):

1. Two-Part Nonsag Polysulfide Sealant

   Bostik Construction Products Division, [Chem-Calk 200]
   W.R. Meadows, Inc., [CM-60]

2. Two-Part Pourable Polysulfide Sealant

   Bostik Construction Products Division, [Chem-Calk 250]

3. Two-Part Water Immersion Polysulfide Sealant

   Bostik Construction Products Division, [Chem-Calk 400]

4. One-Part Polysulfide Sealant

   Bostik Construction Products Division, [Chem-Calk 100]
   Pecora Corp., [Synthacalk GC-9]

5. One-Part Non-Acid Curing Low-Modulus Silicone Sealant

   Bostik Construction Products Division, [Chem-Calk 1000]
   Dow Corning Corp., [Dow Corning 790]

6. One-Part Non-Acid Curing Medium-Modulus Silicone Sealant

   Dow Corning Corp., [Dow Corning 795]
   General Electric Co., [Silpruf]

7. One-Part Acid-Curing Silicone Sealant

   Bostik Construction Products Division, [Chem-Calk 1200]
   Dow Corning Corp., [Dow Corning 999]

8. One-Part Mildew-Resistant Silicone Sealant

   Dow Corning Corp., [Dow Corning 786]
   General Electric Co., [SCS 1702]

9. Two-Part Non-Acid Curing Silicone Sealant for Use T

   Dow Corning Corp., [Dow Corning 888]

10. Multi-Part Nonsag Urethane Sealant for Uses NT, M, G, A, and O

    Bostik Construction Products Division, [Chem-Calk 500]
    Pecora Corp., [Dynatrol II]

11. Two-Part, Nonsag Low-Modulus Urethane Sealant

    Mameco International, Inc., [Vulkem 922]

12. Two-Part, Pourable, Urethane Sealant

    Bostik Construction Products Division, [Chem-Calk 550]
    Mameco International, Inc., [Vulkem 245]

13. Two-Part Nonsag Urethane Sealant for Use T

    Pecora Corp., [Dynatred]

14. One-Part Nonsag Urethane Sealant

    Pecora Corp., [Dynatrol II]

15. One-Part Nonsag Low-Modulus Urethane Sealant

    Mameco International, Inc., [Vulkem 921]
    Sika Corp., [Sikaflex-15LM]

16. One-Part, Pourable, Urethane Sealant

Mameco International, Inc., [Vulkem 45]
Pecora Corp., [NR-201 Urexpan]

17. Acrylic Sealant

    Bostik Construction Products Division, [Chem-Calk 800]
    Pecora Corp., [60+Unicrylic]

18. Butyl Sealant

    Bostik Construction Products Division, [Chem-Calk 600]
    Pecora Corp., [BC-158]

19. Pigmented Small Joint Sealant

    Protective Treatments, Inc., [PTI 200]
    Tremco, Inc., [Tremco Seam Sealer]

20. Latex Joint Sealers

    Bostik Construction Products Division, [Chem-Calk 600]
    Pecora Corp., [AC-20]

21. Acoustical Sealants for Concealed Joints

    Pecora Corp., [BA-98]
    Tremco, Inc., [Tremco Acoustical Sealant]

22 Butyl-Polyisobutylene Sealant

    Protective Treatments, Inc., [PTI 404]

23. Butyl-Polyisobutylene Tape Sealant

    Pecora Corp., [Extru-Seal Tape]
    Protective Treatments, Inc., [PTI 606]

24. Compression Seals

    Emseal Corp., [Emseal Greyflex]
    Illbruck, [Will-Seal Tape Type 250]
    Sandell Manufacturing Co., Inc., [Polytite Standard]

25. Preformed Hollow-Neoprene Gasket

    Acme Highway Products Corp.
    Watson Bowman Associates, Inc.

PART 3 -- EXECUTION

3.1 PROJECT CONDITIONS

A. **Environmental Conditions**: CONTRACTOR shall not proceed with installation of joint sealers under the following conditions:

1. When ambient and substrate temperature conditions are outside the limits permitted by the joint sealer manufacturers.

2. When joint substrates are wet due to rain, frost, condensation, or other causes.

B. **Joint Width Conditions**: Installation of joint sealers shall not proceed when joint widths are less than, or more than, allowed by the joint sealer manufacturer for the application indicated.

3.2 PREPARATION

A. **Surface Cleaning of Joints**: All joints shall be cleaned out immediately before installing joint sealers to comply with recommendations of joint sealer manufacturers and the following requirements:

1. All foreign material shall be removed from joint substrates which could interfere with adhesion of joint sealer, including dust; paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer) oil; grease; waterproofing; water repellents; water, and surface dirt.

2. Concrete, masonry, unglazed surfaces of ceramic tile and similar porous joint substrate surfaces shall be cleaned by brushing, grinding, blast cleaning, mechanical abrading, acid washing or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealers. Loose particles remaining from the above cleaning operations shall be removed by vacuuming or blowing out joints with oil-free compressed air.

3. Laitance and form release agents shall be thoroughly removed from all concrete surfaces.

4. Metal, glass, porcelain enamel, glazed surfaces of ceramic tile and other non-porous surfaces shall be cleaned with chemical cleaners or other means which are not harmful to substrates or leave residues capable of interfering with adhesion of joint sealers.

B. **Joint Priming**: Joint substrates shall be primed where indicated or where recommended by joint sealer manufacturer. Primer shall be applied so as to comply with joint sealer manufacturer's recommendations. Primers shall be confined to areas of joint sealer bond. Spillage or migration onto adjoining surfaces shall not be allowed.

C. **Masking Tape**: Masking tape shall be used where required to prevent contact of sealant with adjoining surfaces which otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Tape shall be removed immediately after tooling without disturbing joint seal.

3.3 INSTALLATION

A. **General**: Unless otherwise indicated, comply with joint sealer manufacturers' printed installation instructions.

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NTS: Edit the following standards, retaining only those which are applicable to the project and the products specified.

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B. **Elastomeric Sealant Installation Standard**: Comply with recommendations of ASTM C 962 for use of joint sealants as applicable to materials, applications and conditions indicated.

C. **Solvent-Release-Curing Sealant Installation Standard**: Comply with requirements of ASTM C 804 for use of solvent-release-curing sealants.

D. **Latex Sealant Installation Standard**: Comply with requirements of ASTM C 790 for use of latex sealants.

E. **Acoustical Sealant Application Standard**: Comply with recommendations of ASTM C 919 for use of joint sealants in acoustical applications as applicable to materials, applications and conditions indicated.

F. **Installation of Sealant Backings**: Install sealant backings to comply with the following requirements:

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NTS: Edit the following requirements, retaining only those which are applicable to the project and the products specified.

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1. Install joint-fillers of the types indicated to provide support of sealants during application and at position necessary to product the required cross-sectional shapes and depths.

    a. Do not leave gaps between ends of joint-fillers.

    b. Do not stretch, twist, puncture or tear joint-fillers.

c. Remove absorbent joint-fillers which have become wet prior to sealant application and replace with dry material.

2. Install bond breaker tape between sealants and joint-fillers, compression seals or back of joints, where required to prevent third-side adhesion of sealant to back of joint.

3. Install compressible seals serving as sealant backings to comply with requirements indicated above for joint-fillers.

G. **Installation of Sealants**: Install sealants by proven techniques that result in sealants directly contacting and fully wetting joint substrates, completely filling recesses provided for each joint configuration and providing uniform, cross-sectional shapes and depths relative to joint widths which allow optimum sealant movement capability.

H. **Tooling of Nonsag Sealants**: Immediately after sealant application and prior to time skinning or curing begins, tool sealants to form smooth, uniform beads of configuration indicated to eliminate air pockets and to ensure contact and adhesion of sealant with sides of joint. Remove excess sealants from surfaces adjacent to joint. Do not use tooling agents which discolor sealants or adjacent surfaces or are not approved by the sealant manufacturer.

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NTS: Edit the following requirements for desired joint configuration.

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1. Concave joint configuration per Figure 6A in ASTM C 962, unless otherwise indicated.]

2. Flush joint configuration per Figure 6B in ASTM C 962, where indicated.]

3. Recessed joint configuration per Figure 6C in ASTM C 962, of recess depth and at locations indicated.

a. Where necessary, use masking tape to protect adjacent surfaces of tooled joints.]

I. **Installation of Preformed Foam Sealants**: Install each length of sealant immediately after removing protective wrapping, taking care not to pull or stretch material, and complying with sealant manufacturer's directions for installation methods, materials and tools which produce seal continuity at ends, turns, and intersections of joints. For applications at low ambient temperatures where expansion of sealant requires acceleration to produce seal, apply heat to sealant in conformance with sealant manufacturer's recommendations.

J. **Installation of Preformed Hollow Neoprene Gaskets**: Install gaskets, with minimum number of end joints, in joint recesses with edges free of spalls and sides straight and parallel, both within tolerances specified by gasket manufacturer. Apply manufacturer's recommended adhesive to joint substrates immediately prior to installing gaskets. For straight sections provide gaskets in continuous lengths; where changes in direction occur, adhesively splice gasket together to provide watertight joints. Recess gaskets below adjoining surfaces by 1/8 inch to 1/4 inch.

3.4 PROTECTION AND CLEANING

A. Protect joint sealers during and after curing period from contact with contaminating substances or from damage resulting from construction operations or other causes so that they are without deterioration or damage at time of substantial completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealers and reseal joints with new materials to produce installations with repaired areas indistinguishable from original work.

B. Clean off excess sealants or sealant smears adjacent to joints as WORK progresses, by methods and with cleaning materials approved by manufacturers of joint sealers and of products in which joints occur.

** END OF SECTION **